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THE VISUAL ACUITY OF THE NATIVES OF SARAWAK. By CHARLES S. MYERS.

During a visit to Borneo in 1898, I estimated the visual acuity of 32 natives, employing the same method as that which Dr Rivers had found the most useful in his investigations among the people of Torres Straits and New Guinea. His results have recently appeared in the Expedition *Reports*[1], where a detailed description of the E method which we employed will be found. I may say here that our E test-types only differed from the ordinary Snellen's test-types in the replacement of the various alphabet-letters by E's of different sizes in one of four positions (the short bars pointing rightwards, leftwards, upwards or downwards). The individual under examination held in his hand a large E, which he was asked to place in the same position as that of the E indicated on the test-type.

Some of the testing was done during a voyage up the Baram River, under conditions where the illumination varied so that I found it necessary to test my own visual acuity on each occasion. The greater part, however, took place on the verandah of Dr Hose's Residency at Claudetown. There the light was approximately of the same brightness as in Murray Island, Torres Straits.

No.	Tribe	Age	Visual acuity[2]	Times 'normal vision'	Improved to	By glasses of strength
Self : $\frac{11{\cdot}5}{5} = 2{\cdot}3$						
1.	Batang Lupar, Sakarrang Dayak	28	$\frac{10}{5}$	2·0		
2.	Milano from lower Baram River	50	$\frac{2{\cdot}5}{5}$	0·5	1·6	+1 D sph.
3.	Barawan from Tinjar River	45	$\frac{4}{5}$	0·8		
4.	Muka, Milano	50	$\frac{2{\cdot}5}{5}$	0·5		
5.	Batang Lupar Dayak	55	$\frac{6}{5}$	1·2		
6.	Barawan from Tinjar River	35	$\frac{3}{5}$	0·6	0·8	+1 D sph.

[1] *Reports of the Cambridge Anthropological Expedition to Torres Straits*, Vol. II. Pt. 1, Cambridge University Press, 1901.

[2] The denominator expresses the size of type read by the observer at the distance expressed in metres by the numerator.

No.	Tribe	Age	Visual acuity	Times 'normal vision'	Improved to	By glasses of strength
7.	Uma Poh, Kayan	27	$\frac{9}{5}$	1·8		
8.	Tinjar River, mixed tribe	18	$\frac{9}{5}$	1·8		
9.	Punan from Tinjar River	19	$\frac{8}{5}$	1·6		
10.	Saribas Dayak	19	$\frac{10}{5}$	2·0		
11.	Batang Lupar Dayak	19	$\frac{11}{5}$	2·2		
12.	Brunei Malay	24	$\frac{4}{5}$	0·8	1·4	R.E. −3 D cyl. ax. vert. L.E. −2 D cyl. ax. vert.
13.	Semanggang Dayak	28	$\frac{11·5}{5}$	2·3		
14.	,, ,,	26	$\frac{7}{5}$	1·4		
15.	,, ,,	28	$\frac{9}{5}$	1·8		
16.	Long Kiput	63	$\frac{6}{5}$	1·2		
17.	Barawan from Tinjar River	45	$\frac{6}{5}$	1·2		
Self: $\frac{13}{6}=2·2$						
18.	Barawan from Tinjar River	17	$\frac{9}{6}$	1·5		
19.	Punan	16	$\frac{15}{6}$	2·5		
20.	Barawan from Tinjar River	25	$\frac{11}{6}$	1·8		
Self: $\frac{12}{6}$ or $\frac{10}{5}=2·0$						
21.	Tribe unknown	50	$\frac{11}{6}$	1·8		
22.	,,	17	$\frac{12}{6}$	2·0		
23.	,,	24	$\frac{8}{6}$	1·3		
24.	,,	28	$\frac{11}{6}$	1·8		
25.	Rejang River, Sakarrang	26	$\frac{6}{5}$	1·2		
26.	Semanggang Dayak	29	$\frac{8·5}{5}$	1·7		
27.	Barawan	25	$\frac{9·5}{5}$	1·9		
28.	,,	17	$\frac{8·5}{5}$	1·7		
Self: $\frac{11}{6}$ or $\frac{9}{5}=1·8$						
29.	Batang Lupar Dayak	24	$\frac{8}{5}$	1·6		
30.	,, ,, ,,	35	$\frac{7}{5}$	1·4		
31.	Rejang River Sakarrang	20	$\frac{10}{5}$	2·0		
32.	,, ,, ,,	38	$\frac{4}{5}$	0·8	1·4	−1 D cyl. ax. vert.

Astigmatism was clearly present in Nos. 1, 4, and 23, besides in Nos. 12 and 32. At 10·5 metres, No. 1 could only read the E of No. 5 type in positions ㅁ and ㅂ. Nos. 4 and 23, on the contrary, could only read E and ヨ, the former (No. 5 type) at 3 metres, the latter (No. 6 type) at 9 metres.

If the variability of illumination be neglected, the average visual acuity of the above 32 natives is nearly $\frac{7·5}{5}$; that is, it is about one and a half times the so-called normal acuity. The average visual acuity obtained by Dr Rivers in Torres Straits and New Guinea is $\frac{10·6}{5}$, four

out of 115 Murray Islanders tested by him showing a visual acuity more than three times as great as normal. It must be remembered that there were also fluctuations in light-intensity during these observations and that my own visual acuity may have varied from time to time with my state of health. But even if full allowance be made for changes in illumination, the visual acuity of the people of Sarawak falls considerably below that of the Papuan tribes.

Nor can this difference be ascribed to the examination of a less number of boys or greater number of old men in Sarawak. The visual acuity of 24 Sarawak adults below the age of 36 is $\frac{9}{5}$; that of Mabuiag Islanders of the same age is $\frac{13}{5}$.

After reviewing the results obtained elsewhere, which Dr Rivers has with great pains brought together in the *Reports*, it has seemed to me likely that the vision of African, Australian and Papuan races is naturally more acute than that of Mongolian, Malayan, Polynesian and Mediterranean races. But this must remain a mere suggestion until a greater number of observations has been made. I extract from Dr Rivers' article (pp. 16—19) the evidence which has led me to this conclusion.

13	Nubians (Kotelmann)	2·60	Probably E method
4	Zulus (König)	3·37	E or C method
100	Congolese (Pergens)	? 2·80	Steiger's types
115	Murray Islanders (Rivers)	2·06	E method
36	Mabuiag ,, ,,	2·32	,,
19	Kiwai ,, ,,	2·06	,,
6	young adult Australians (Rivers)	2·50	,,
24	young adult Sarawak males (Myers)	1·80	,,
5	,, ,, Samoans (Rivers)	1·96	,,
5	? ? Brazilians (Ranke)	1·58	C method
6	American Indians (Schött)	1·42	Probably Snellen's letter types
4	Hawaians (Seggel)	1·85	Burchardt's dots
7	out of 15 Lapps examined (Seggel)	= or < 1·00	,, ,,
100	young adult Egyptians (Cohn)	1·55	E method